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Short Notes on Aquatic Biomonitoring Design and Implementation

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Editorial

The aquatic ecosystem, which includes coastal waters, rivers, and lakes, is constantly threatened by anthropogenic wastewater infiltration and drainage. As a result, this environmental hazard necessitates the continuous and consistent implementation of up-to-date monitoring systems that are more comprehensive, perceptive, and specific to targeted pollutants. Recently, genomic-based tools have largely replaced cumbersome morphological monitoring tools as a routine tool in cutting-edge research and biotechnologies. However, the use of modern genomics tools in environmental bio monitoring is still considered a novel approach that requires more knowledge to be applied in aquatic bio monitoring. Until recently, environmental genomics was primarily used to screen for morphologically distinct bio-indicator taxa [1-3].

Enteric viruses (EVs) occur naturally in their infective (active) form in aquatic environments and are frequently introduced alongside bacterial and parasitic microbes via anthropogenic activities such as agricultural runoff, urban runoff, leaking sewage and septic systems, sewage outfall, and vessel wastewater discharge. EVs replicate in the epithelial cells of the host gastrointestinal (GIT) tract and are secreted in extremely high numbers in the faeces of infected patients (105 and 1011 viral particle/gram of stool) after being transmitted via the fecal-oral route. EVs are commonly secreted indirectly into aquatic groundwater, rivers, aerosols discharged from sewage/wastewater treatment plants, estuarine water, inefficiently treated water, and drinking water receiving untreated contaminated wastewater, and wastewater-contaminated private wells, in addition to anthropogenic activities. In addition to diarrhoea and self-limiting gastroenteritis in infected humans, EVs can cause more life-threatening complicated syndromes such as respiratory tract (RT) infections, conjunctivitis, hepatitis, and diseases with high severity and fatality rates (e.g., aseptic meningitis, encephalitis, and paralysis). Furthermore, some EV infections are linked to chronic diseases, such as insulin-dependent diabetes mellitus (type 1 diabetes) and inflammatory cardiomyopathy (also known as myocarditis). In contrast, infections with enteric viruses are typically asymptomatic in domestic animals (e.g., cattle and swine), but can occasionally result in unfavourable economic losses such as abortion and diseases of the animal's central/peripheral nervous system (neurological disorders)

This review article discusses available and implemented detection tools for monitoring multispecies viral pathogens, including EVs and non-EVs, in order to provide comprehensive water-based epidemiology and bio monitoring. The accurate and precise detection of viral pathogens in surface or wastewater samples can provide vital information for controlling the source of pollution, defining human-related health risks, and possible zoonotic and reverse zoonotic events [4,5]. This also has an impact on public health by better understanding the prevalence of human and non-human EVs and making viral pathogen documentation easier for water quality assessment tools and library-independent source tracking. There are over 200 recognised EVs classified into at least 13 viral families, with 140 serotypes known to infect humans and cause diseases with varying symptoms and severity. EVs are typically transmitted via the fecal-oral route and primarily infect the GIT of the host, whether human or domestic animal, resulting in relatively high virus shedding in their faeces.

When EVs are transmitted, they are frequently the following families of EVs are of particular interest in terms of epidemiology and pathogenicity in humans: (a) Picornaviridae (coxsackieviruses, polioviruses, enteroviruses, and echoviruses); (b) Adenoviridae (adenoviruses); (c) Caliciviridae (NoVs, astroviruses, and caliciviruses); and (d) Reovi (reoviruses and RVs). The properties of EVs, as well as the associated health riskassociated with gastroenteritis (mild and localised infection) or serious acute illnesses, such as central nervous system infections (meningitis, encephalitis, and poliomyelitis), respiratory diseases, conjunctivitis, and non-specific febrile illnesses. Furthermore, EVs have been linked to the etiology of some chronic diseases, such as chronic fatigue syndrome and diabetes mellitus.

Most EVs, unlike enveloped viruses, have distinct cellular and molecular structures, making them more resistant to many natural disinfection factors such as slow sand filtration, soil infiltration/percolation, drying out and/or heat, and less tolerant to conventional viral removal water treatment technologies such as ultraviolet (UV) irradiation and active chlorine, chlorine dioxide, ozone, and per acetic acid. To this point, advanced technologies such as ozone and hydrogen peroxide, ozone and UV radiation, hydrogen peroxide and UV radiation, UV radiation with titanium dioxide, and finally advanced membrane technologies have been used in wastewater and drinking water treatment plants.

Conflict of Interest

None.

References

1. Kim, Wooseong, Muhammad Muneer Umar and Shafiullah Khan, et al. "Novel scoring for energy-efficient routing in multi-sensored Networks." *Sens* 22 (2022): 1673.
2. Semchedine, Fouzi, Nadir Ait Saidi, Larbi Belouzir, and Louiza Bouallouche-Medjkoune. "QoS-based protocol for routing in wireless sensor networks." *Wirel Pers Commun* 97 (2017): 4413-4429.
3. Martínez, William Ruíz, Yesid Díaz-Gutiérrez and Roberto Ferro-Escobar, et al. "Application of the internet of things through a network of wireless sensors in a coffee crop for monitoring and control its environmental variables." *TecnoLógicas* 22 (2019): 155-170.
4. Ku, Meng-Lin, Wei Li and Yan Chen, et al. "Advances in energy harvesting communications: Past, present, and future challenges." *IEEE Commun Surv Tutor* 18 (2015): 1384-1412.
5. Sharma, Neelam, B.M. Singh, and Karan Singh. "QoS-based energy-efficient protocols for wireless sensor network." *Sustain Comput Inform Syst* 30 (2021): 100425.

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